What is claimed is:

1. A method for generating a pulse train, comprising the steps of:

providing a frequency modulated signal; and

impinging the signal on a dispersive element, said dispersive element being adapted to compress the signal in time.

2. The method of claim 1, wherein the dispersive element is a fiber Bragg grating.

3. The method of claim 1, wherein the dispersive element is single mode fiber.

4. The method of claim 3, wherein the fiber has a length of at least about 40 km.

5. The method of claim 3, wherein the fiber has a length of at least about 60 km.

6. The method of claim 3, wherein the fiber has a length of at least about 80 km.

7. The method of claim 1, wherein the signal has a single longitudinal mode.

8. The method of claim 1, wherein the signal is generated by a laser equipped with a reflective element, and wherein the signal is frequency modulated by applying a current across the mirror.

9. The method of claim 8, wherein the current modulates the center wavelength of the reflective element by way of carrier induced index changes.

10. A method for frequency modulating the optical carrier in a laser, comprising the steps of:

providing a laser equipped with a distributed Bragg reflector and having an optical carrier;

impinging the optical carrier on the distributed Bragg reflector; and

rapidly tuning the distributed Bragg reflector so as to modulate the frequency of the optical carrier.

11. The method of claim 10, wherein the reflector is tuned by applying a high frequency current signal thereto.

12. The method of claim 11, wherein the current signal has a frequency of at least 0.5 GHz.

13. The method of claim 10, wherein the optical signal is frequency modulated with a modulation index of about 50.

14. An apparatus for producing a frequency modulated signal, comprising:

a rapidly tunable laser; and

a passive dispersive element in optical communication with said laser; wherein said dispersive element comprises (i) a fiber Bragg grating, and (ii) a circulator.

15. The apparatus of claim 14, wherein the dispersive element is at the output of said laser.

16. The apparatus of claim 14, wherein the laser comprises a cavity, and wherein the dispersive element is disposed inside of said cavity.

17. The apparatus of claim 14, further comprising an electronic signal generator adapted to modulate the frequency of the laser.

18. The apparatus of claim 14, wherein the laser is equipped with a mirror, and wherein the electronic signal generator is adapted to drive the mirror.

19. A method for conducting high speed optical sampling for A/D conversion, using the apparatus of claim 14.

20. A method for optimizing the peak intensity of a non-linear optical signal, comprising the steps of:

generating a modulation signal using the apparatus of claim 14; and
tailoring the dispersive element to the modulation signal.

21. The method of claim 20, wherein the modulation signal is a sawtooth wave.

22. The method of claim 14, wherein the dispersive element is a sinusoidally chirped fiber Bragg grating.

23. A method for optimizing the peak intensity of a non-linear optical signal, comprising the steps of:
generating a modulation signal using the apparatus of claim 14; and
tailoring the modulation signal to the dispersive element.

24. The method of claim 14, wherein the modulation signal is a sawtooth wave.

25. An optical communications system comprising the apparatus of claim 14.

26. An apparatus for producing a frequency modulated signal, comprising:
a signal source adapted to generate a frequency modified signal; and
a passive dispersive element in optical communication with said source;
wherein the dispersive element comprises (i) a fiber Bragg grating, and (ii) a circulator.

27. The apparatus of claim 26, wherein the signal is frequency modified by way of a current induced change in the index of refraction on a reflective element contained therein

28. The apparatus of claim 26, wherein the signal source is a single mode signal source.

29. A method for producing a pulse train, comprising the steps of:
providing a source of a frequency modified optical signal;
providing a dispersive element; and
directing the signal into the dispersive element;

wherein the source is a frequency modified laser, and wherein the dispersive element is a long fiber Bragg grating.

30. The method of claim 29, wherein the source is a single mode signal source.